



Billion-Dollar U.S. Weather/Climate Disasters 1980-2012 National Climatic Data Center Asheville, NC



<http://www.ncdc.noaa.gov/billions/>

The U.S. has sustained 144 weather/climate disasters since 1980 in which overall damages/costs reached or exceeded \$1 billion. Values in parentheses represent the 2013 Consumer Price Index (CPI) cost adjusted value (if different than original value). The total cost of these 144 events exceeds \$1 trillion.

2012

U.S. Drought/Heatwave - 2012: The 2012 drought is the most extensive drought to affect the U.S. since the 1930s. Moderate to extreme drought conditions affected more than half the country for a majority of 2012. The following states were affected: CA, NV, ID, MT, WY, UT, CO, AZ, NM, TX, ND, SD, NE, KS, OK, AR, MO, IA, MN, IL, IN, GA. Costly drought impacts occurred across the central agriculture states resulting in widespread harvest failure for corn, sorghum and soybean crops, among others. The associated summer heatwave also caused 123 direct deaths, but an estimate of the excess mortality due to heat stress is still unknown. Total Estimated Costs: \$30.0 (30.3) Billion; 123 Deaths

Western Wildfires - Summer-Fall, 2012: Wildfires burned over 9.2 million acres across the U.S. in 2012. This is the 3rd highest annual total since the year 2000. The most damaging wildfires occurred in the western states (CO, ID, WY, MT, CA, NV, OR, WA). Colorado experienced the most costly wildfires (e.g., Waldo Canyon fire) where several hundred residences were destroyed. Total Estimated Costs: \$1.0 Billion; 8 Deaths

Sandy - October 2012: Extensive damage across several northeastern states (MD, DE, NJ, NY, CT, MA, RI) due to high wind and coastal storm surge, particularly NY and NJ. Damage from wind, rain and heavy snow also extended more broadly to other states (NC, VA, WV, OH, PA, NH), as Sandy merged with a developing Nor'easter. Sandy's impact on major population centers caused widespread interruption to critical water / electrical services and also caused 159 deaths (72 direct, 87 indirect). Sandy also caused the New York Stock Exchange to close for two consecutive business days, which last happened in 1888 due to a major winter storm. Total Estimated Costs: \$65.0 (65.7) Billion; 159 Deaths

Hurricane Isaac - August 2012: Category 1 hurricane made landfall over Louisiana. Isaac's slow motion and large size led to a large storm surge and flooding rains. This created damage across several southeastern states (LA, MS, AL, FL) including 9 deaths (5 direct, 4 indirect). Total Estimated Costs: \$2.3 Billion; 9 Deaths

Plains/East/Northeast Severe Weather - June 29-July 2 2012: Sustained outbreak of thunderstorms / high winds from a strong derecho event over the central, eastern, and northeastern states (IL, IN, KY, OH, WV, SC, NC, VA, MD, DC, NJ). Total Estimated Costs: \$2.9 Billion; 28 Deaths

Rockies/Southwest Severe Weather - June 6-12 2012: Severe storms and damaging hail over several states (CO, NM, TX) with 25 confirmed tornadoes. Colorado experienced over \$1.0 billion in damage due to hail. Total Estimated Costs: \$2.6 Billion

Southern Plains/Midwest/Northeast Severe Weather - May 25-30 2012: Severe storms over the southern plains, midwest and northeast (TX, OK, KS, MN, PA, NY) with 27 confirmed tornadoes. Significant damage also from severe hail and straight-line winds. Total Estimated Costs: \$2.3 Billion; 1 Deaths

Midwest/Ohio Valley Severe Weather - April 28-May 1 2012: Severe weather over the midwest and Ohio Valley (TX, OK, KS, MO, IL, IN, KY) with 38 confirmed tornadoes. Considerable damage resulting from hail. Total Estimated Costs: \$3.3 Billion; 1 Deaths

Midwest Tornadoes - April 13-14 2012: Outbreak of tornadoes and severe weather over the midwest (OK, KS, NE, IA) with 98 confirmed tornadoes including many tornadoes that remained on the ground for an extended time - traveling tens of miles. Total Estimated Costs: \$1.1 Billion; 6 Deaths

Texas Tornadoes - April 2-3 2012: Outbreak of tornadoes across the greater Dallas-Ft. Worth metropolitan area. Several moderate strength tornadoes (EF-2 and EF-3) affected towns in this area with a total of 22 confirmed tornadoes. Total Estimated Costs: \$1.0 Billion

Southeast/Ohio Valley Tornadoes - March 2-3 2012: Outbreak of tornadoes and severe weather over the southeast and Ohio Valley (AL, GA, IN, OH, KY, TN) with 75 confirmed tornadoes. Total Estimated Costs: \$3.1 Billion; 42 Deaths

2011

Southern Plains/Southwest Drought & Heat Wave - 2011: Drought and heat wave conditions created major impacts across Texas, Oklahoma, New Mexico, Arizona, southern Kansas, and western Louisiana. In Texas and Oklahoma, a majority of range and pastures were classified in "very poor" condition for much of the 2011 crop growing season. Total Estimated Costs: \$12.0 (12.4) Billion; 95 Deaths

Texas, New Mexico, Arizona Wildfires - Summer 2011: Continued drought conditions and periods of extreme heat provided conditions favorable for a series of historic wildfires across Texas, New Mexico and Arizona. The Bastrop Fire in Texas was the most destructive fire in Texas history destroying over 1,500 homes. The Wallow Fire consumed over 500,000 acres in Arizona making it the largest on record in Arizona. The Las Conchas Fire in New Mexico was also the state's largest wildfire on record scorching over 150,000 acres while threatening the Los Alamos National Laboratory. Over 3 million acres have burned across Texas this wildfire season. Total Estimated Costs: \$1.0 Billion; 5 Deaths

Tropical Storm Lee - September 2011: Wind and flood damage across the southeast (LA, MS, AL, GA, TN) but considerably more damage from record flooding across the northeast (PA, NY, NJ, CT, VA, MD). Pennsylvania and New York were most affected. Total Estimated Costs: \$1.3 Billion; 21 Deaths

Hurricane Irene - August 2011: Category 1 hurricane made landfall over coastal NC and moved northward along the Mid-Atlantic Coast (NC, VA, MD, NJ, NY, CT, RI, MA, VT) causing torrential rainfall and flooding across the Northeast. Wind damage in coastal NC, VA, and MD was moderate with considerable damage resulting from falling trees and power lines, while flooding caused extensive flood damage across NJ, NY, and VT. Over seven million homes and businesses lost power during the storm. Numerous tornadoes were also reported in several states further adding to the damage. Total Estimated Costs: \$9.8 (10.1) Billion; 45 Deaths

Rockies and Midwest Severe Weather - July 10-14, 2011: An outbreak of tornadoes, hail, and high wind caused damage east of the Rockies and across the central plains (CO, WY, IA, IL, MI, MN, OH). Total Estimated Costs: \$1.0 Billion; 2 Deaths

Missouri River flooding - Summer 2011: Melting of an above-average snow pack across the Northern Rocky Mountains combined with above-average precipitation caused the Missouri and Souris Rivers to swell beyond their banks across the Upper Midwest (MT, ND, SD, NE, IA, KS, MO). An estimated 11,000 people were forced to evacuate Minot, North Dakota due to the record high water level of the Souris River, where 4,000 homes were flooded. Numerous levees were breached along the Missouri River, flooding thousands of acres of farmland. Total Estimated Costs: \$2.0 (2.1) Billion; 5 Deaths

Midwest/Southeast Tornadoes and Severe Weather - June 18-22, 2011: Outbreak of tornadoes over central states (OK, TX, KS, NE, MO, IA, IL) with an estimated 81 tornadoes. Additional wind and hail damage across the Southeast (TN, GA, NC, SC). Total Estimated Costs: \$1.3 Billion; 3 Deaths

Mississippi River flooding - May 2011: Persistent rainfall (nearly 300 percent normal precipitation amounts in the Ohio Valley) combined with melting snowpack caused historical flooding along the Mississippi River and its tributaries. Examples of economic damage include: \$500 million to agriculture in Arkansas; \$320 million in damage to Memphis, Tennessee; \$800 million to agriculture in Mississippi; \$317 million to agriculture and property in

Missouri's Birds Point-New Madrid Spillway; \$80 million for the first 30 days of flood fighting efforts in Louisiana. Total Estimated Costs: \$3.0 (3.1) Billion; 7 Deaths

Midwest/Southeast Tornadoes - *May 22-27, 2011*: Outbreak of tornadoes over central and southern states (MO, TX, OK, KS, AR, GA, TN, VA, KY, IN, IL, OH, WI, MN, PA) with an estimated 180 tornadoes. Notably, an EF-5 tornado struck Joplin, MO resulting in at least 160 deaths, making it the deadliest single tornado to strike the U.S. since modern tornado record keeping began in 1950. Total Estimated Costs: \$9.1 (9.4) Billion; 177 Deaths

Southeast/Ohio Valley/Midwest Tornadoes - *April 25-28, 2011*: Outbreak of tornadoes over central and southern states (AL, AR, LA, MS, GA, TN, VA, KY, IL, MO, OH, TX, OK) with an estimated 343 tornadoes. The deadliest tornado of the outbreak, an EF-5, hit northern Alabama, killing 78 people. Several major metropolitan areas were directly impacted by strong tornadoes including Tuscaloosa, Birmingham, and Huntsville in Alabama and Chattanooga, Tennessee, causing the estimated damage costs to soar. Total Estimated Costs: \$10.2 (10.5) Billion; 321 Deaths

Midwest/Southeast Tornadoes - *April 14-16, 2011*: Outbreak of tornadoes over central and southern states (OK, TX, AR, MS, AL, GA, NC, SC, VA, PA) with an estimated 177 tornadoes. Total Estimated Costs: \$2.1 (2.2) Billion; 38 Deaths

Southeast/Midwest Tornadoes - *April 8-11, 2011*: Outbreak of tornadoes over central and southern states (NC, SC, TN, AL, TX, OK, KS, IA, WI) with an estimated 59 tornadoes. Total Estimated Costs: \$2.2 (2.3) Billion

Midwest/Southeast Tornadoes - *April 4-5, 2011*: Outbreak of tornadoes over central and southern states (KS, MO, IA, IL, WI, KY, GA, TN, NC, SC) with an estimated 46 tornadoes. Total Estimated Costs: \$2.8 (2.9) Billion; 9 Deaths

Groundhog Day Blizzard - *February 1-3, 2011*: A large winter storm impacted many central, eastern and northeastern states. The city of Chicago was brought to a virtual standstill as between 1 and 2 feet of snow fell over the area. Total Estimated Costs: \$1.8 (1.9) Billion; 36 Deaths

2010

Arizona Severe Weather - *October 2010*: An unusual series of severe thunderstorms across Arizona produced numerous tornadoes and widespread, severe hail damage. Over one-hundred buildings were damaged or destroyed by tornadoes while thousands of automobiles and buildings were damaged by large hail across Phoenix and surrounding cities. Total Estimated Costs: \$2.0 (2.1) Billion

East/South Flooding and Severe Weather - *May 2010*: Flooding, hail, tornadoes, and severe thunderstorms occurred across many Southern states (TN, AR, AL, KY, MS, GA) on April 30-May 2. Flooding in the Nashville, TN area alone contributed > \$1.0 billion in damages. Western and Middle Tennessee were hardest hit with local rainfall amounts of 18-20 inches to the south and west of Greater Nashville. Total Estimated Costs: \$2.3 (2.5) Billion; 32 Deaths

Oklahoma, Kansas, and Texas Tornadoes and Severe Weather - *May 2010*: An outbreak of tornadoes, hail, and severe thunderstorms occurred across Oklahoma, Kansas, and Texas in mid-May. Oklahoma was hardest hit with > \$1.5 billion in damages. Total Estimated Costs: \$3.0 (3.2) Billion; 3 Deaths

Northeast Flooding - *March 2010*: Heavy rainfall over portions of the Northeast in late March caused extensive flooding across several states (RI, CT, MA, NJ, NY, PA). The event caused the worst flooding in Rhode Island's history. Total Estimated Costs: \$1.5 (1.6) Billion; 11 Deaths

2009

Southwest/Great Plains Drought - *2009*: Drought conditions occurred during much of the year across parts of the Southwest, Great Plains, and southern Texas causing agricultural losses in numerous states (TX, OK, KS, CA, NM, AZ). The largest agriculture losses occurred in TX and CA. Total Estimated Costs: \$5.0 (5.4) Billion

Western Wildfires - *Summer/Fall 2009*: Residual and sustained drought conditions across western and south-central states resulted in thousands of wildfires. Most affected states include CA, AZ, NM, TX, OK, and UT. National acreage burned exceeding 5.9 million. Over 200 homes and structures destroyed in the California "Station" fire alone. Total Estimated Costs: \$1.0 (1.1) Billion; 10 Deaths

Midwest, South and East Severe Weather - *June 2009*: Sustained outbreak of thunderstorms and high winds from a strong derecho event over the central, southern, and eastern states (TX, OK, MO, NE, KS, AR, AL, MS, TN, NC, SC, KY, PA). Total Estimated Costs: \$1.1 (1.2) Billion

South/Southeast Severe Weather & Tornadoes - *April 2009*: Outbreak of tornadoes, hail and severe thunderstorms over the south and southeastern states (AL, AR, GA, KY, MO, SC, TN) with 85 confirmed tornadoes. Total Estimated Costs: \$1.2 (1.3) Billion; 6 Deaths

Midwest/Southeast Tornadoes - *March 2009*: Outbreak of tornadoes over central and southern states (NE, KS, OK, IA, TX, LA, MS, AL, GA, TN, KY) with 56 tornadoes confirmed. Total Estimated Costs: \$1.0 (1.1) Billion

Southeast/Ohio Valley Severe Weather - *February 2009*: Complex of severe thunderstorms and high winds across the region (TN, KY, OK, OH, VA, WV, PA). Total Estimated Costs: \$1.4 (1.5) Billion; 10 Deaths

2008

Widespread Drought - *2008*: Severe drought and heat caused agricultural losses in areas of the south and west. Record low lake levels also occurred in areas of the southeast. Includes states of CA, TX, NC, SC, GA, and TN. Total Estimated Costs: \$2.0 (2.2) Billion

U.S. Wildfires - *Fall 2008*: Drought conditions across numerous western, central and southeastern states (AK, AZ, CA, NM, ID, UT, MT, NV, OR, WA, CO, TX, OK, NC, FL) resulted in thousands of wildfires; national acreage burned exceeding 5.2 million acres (mainly in the west) and over 1,000 homes and structures destroyed in California fires alone. Total Estimated Costs: \$2.0 (2.2) Billion; 16 Deaths

Hurricane Ike - *September 2008*: Category 2 hurricane makes landfall in Texas, as the largest (in size) Atlantic hurricane on record, causing considerable storm surge in coastal TX and significant wind and flooding damage in TX, LA, AR, TN, IL, IN, KY, MO, OH, MI and PA. Severe gasoline shortages occurred in the southeast U.S. due to damaged oil platforms, storage tanks, pipelines and off-line refineries. Total Estimated Costs: \$27.0 (29.2) Billion; 112 Deaths

Hurricane Gustav - *September 2008*: Category 2 hurricane makes landfall in Louisiana causing significant wind, storm surge, and flooding damage in AL, AR, LA, and MS. Total Estimated Costs: \$5.0 (5.4) Billion; 53 Deaths

Hurricane Dolly - *July 2008*: Category 2 hurricane makes landfall in southern Texas causing considerable wind and flooding damage in TX and NM. Total Estimated Costs: \$1.2 (1.3) Billion; 3 Deaths

Midwest Flooding - *Summer 2008*: Heavy rain and flooding caused significant agricultural loss and property damage in IA, IL, IN, MO, MN, NE, and WI with IA being hardest hit with widespread rainfall totals ranging from 4 to over 16 inches. Total Estimated Costs: \$15.0 (16.2) Billion; 24 Deaths

Midwest/Mid-Atlantic Severe Weather - *June 2008*: An outbreak of tornadoes and thunderstorms over the Midwest/Mid-Atlantic states (IA, IL, IN, KS, NE, MI, MN, MO, OK, WI, MD, VA, WV). Total Estimated Costs: \$1.1 (1.2) Billion; 18 Deaths

Midwest Tornadoes and Severe Weather - *May 2008*: Outbreak of tornadoes over the Midwest/Ohio Valley regions (IL, IN, IA, KS, MN, NE, OK, WY, CO) with 235 tornadoes confirmed. Total Estimated Costs: \$2.4 (2.6) Billion; 13 Deaths

Southeast Tornadoes and Severe Weather - *February 2008*: Series of tornadoes and severe thunderstorms across the Southeast and Midwest states (AL, AR, IN, KY, MS, OH, TN, TX) with 87 tornadoes confirmed. Total Estimated Costs: \$1.0 (1.1) Billion; 57 Deaths

2007

Plains/Eastern Drought - *Summer/Fall 2007*: Severe drought with periods of extreme heat over most of the southeast and portions of the Great Plains, Ohio Valley, and Great Lakes area, resulting in major reductions in crop yields, along with very low stream-flows and lake levels. Includes states of ND, SD, NE, KS, OK, TX, MN, WI, IA, MO, AR, LA, MS, AL, GA, NC, SC, FL, TN, VA, WV, KY, IN, IL, OH, MI, PA, NY. Total Estimated Costs: \$5.0 (5.6) Billion; 15 Deaths

Western Wildfires - *Summer 2007*: Continued drought conditions and high winds over much of the western U.S. (AK, AZ, CA, ID, UT, MT, NV, OR, WA) resulting in numerous wildfires; with national acreage burned exceeding 8.9 million acres (mainly in the west) and over 3,000 homes and structures destroyed in southern California alone. Total Estimated Costs: \$1.0 (1.1) Billion; 12 Deaths

East/South Severe Weather - *April 2007*: Flooding, hail, tornadoes, and severe thunderstorms across numerous states (CT, DE, GA, LA, ME, MD, MA, MS, NH, NJ, NY, NC, PA, RI, SC, TX, VT, VA) in mid-April, including 3 "killer" tornadoes. Total Estimated Costs: \$1.5 (1.7) Billion; 9 Deaths

Spring Freeze - *April 2007*: Widespread severe freeze over much of the east and midwest (AL, AR, GA, IL, IN, IA, KS, KY, MS, MO, NE, NC, OH, OK, SC, TN, VA, WV), causing significant losses in fruit crops, field crops (especially wheat), and the ornamental industry. Temperatures in the teens/20s accompanied by rather high winds nullified typical crop-protection systems. Total Estimated Costs: \$2.0 (2.2) Billion

California Freeze - *January 2007*: Widespread agricultural freeze -- for nearly two weeks in January, overnight temperatures over a good portion of California dipped into the 20s, destroying numerous agricultural crops; with citrus, berry, and vegetable crops most affected. Total Estimated Costs: \$1.4 (1.6) Billion; 1 Deaths

2006

Numerous Wildfires - *2006*: Numerous wildfires mainly over the western half of the country due to dry weather and high winds, burning nearly 10 million acres (new record for period since 1960), with the most affected states being AK, AZ, CA, CO, FL, ID, MT, NM, NV, OK, OR, TX, WA, WY. Total Estimated Costs: \$1.0 (1.2) Billion; 28 Deaths

Widespread Drought - *Spring-Summer 2006*: Rather severe drought affected crops especially during the spring-summer, centered over the Great Plains region with other areas affected across portions of the south and far west -- including states of ND, SD, NE, KS, OK, TX, MN, IA, MO, AR, LA, MS, AL, GA, FL, MT, WY, CO, NM, CA. Total Estimated Costs: \$6.0 (6.9) Billion

Northeast Flooding - *June 2006*: Severe flooding over portions of the northeast due to several weeks of heavy rainfall, affecting the states of NY, PA, DE, MD, NJ, and VA. Total Estimated Costs: \$1.0 (1.2) Billion; 20 Deaths

Midwest/Southeast Tornadoes - *April 6-8, 2006*: Severe weather and numerous tornadoes affecting the states of OK, KS, MO, NE, KY, OH, TN, IN, MS, GA, and AL on April 6-8 with 3 "killer" tornadoes in TN. Total Estimated Costs: \$1.5 (1.7) Billion; 10 Deaths

Midwest/Ohio Valley Tornadoes - *April 2-3, 2006*: Significant outbreak of tornadoes and severe weather affecting the states of IL, IN, IA, AR, MO, KY, and TN on April 2nd with 5 "killer" tornadoes. Total Estimated Costs: \$1.1 (1.3) Billion; 27 Deaths

Severe Storms and Tornadoes - *March 2006*: Outbreak of tornadoes over portions of the midwest and south during a week-long period-affecting the states of AL, AR, KY, MS, TN, TX, IN, KS, MO, and OK. Total Estimated Costs: \$1.0 (1.2) Billion; 10 Deaths

2005

Hurricane Wilma - *October 2005*: Category 3 hurricane hits SW Florida resulting in strong damaging winds and major flooding across southeastern Florida. Prior to landfall, Wilma as a Category 5 recorded the lowest pressure (882 mb) ever recorded in the Atlantic basin. Total Estimated Costs: \$16.0 (19.0) Billion; 35 Deaths

Hurricane Rita - *September 2005*: Category 3 hurricane hits Texas-Louisiana border coastal region, creating significant storm surge and wind damage along the coast, and some inland flooding in the FL panhandle, AL, MS, LA, AR, and TX. Prior to landfall, Rita reached the third lowest pressure (897 mb) ever recorded in the Atlantic basin. Total Estimated Costs: \$16.0 (19.0) Billion; 119 Deaths

Midwest Drought - *Spring, Summer 2005*: Rather severe localized drought causes significant crop losses (especially for corn and soybeans) in the states of AR, IL, IN, MO, OH, and WI. Total Estimated Costs: \$1.0 (1.2) Billion

Hurricane Katrina - *August 2005*: Category 3 hurricane initially impacts the U.S. as a Category 1 near Miami, FL, then as a strong Category 3 along the eastern LA-western MS coastlines, resulting in severe storm surge damage (maximum surge probably exceeded 30 feet) along the LA-MS-AL coasts, wind damage, and the failure of parts of the levee system in New Orleans. Inland effects included high winds and some flooding in the states of AL, MS, FL, TN, KY, IN, OH, and GA. Total Estimated Costs: \$125.0 (148.8) Billion; 1,833 Deaths

Hurricane Dennis - *July 2005*: Category 3 hurricane makes landfall in western Florida panhandle resulting in storm surge and wind damage along the FL-AL coasts, along with scattered wind and flood damage in GA, MS, and TN. Total Estimated Costs: \$2.0 (2.4) Billion; 15 Deaths

2004

Hurricane Jeanne - *September 2004*: Category 3 hurricane makes landfall in east-central Florida, causing considerable wind, storm surge, and flooding damage in FL, with some flood damage also in the states of GA, SC, NC, VA, MD, DE, NJ, PA, and NY. Puerto Rico also affected. Total Estimated Costs: \$7.0 (8.6) Billion; 28 Deaths

Hurricane Ivan - *September 2004*: Category 3 hurricane makes landfall on Gulf coast of Alabama, with significant wind, storm surge, and flooding damage in coastal AL and FL panhandle, along with wind/flood damage in the states of GA, MS, LA, SC, NC, VA, WV, MD, TN, KY, OH, DE, NJ, PA, and NY. Total Estimated Costs: \$14.0 (17.2) Billion; 57 Deaths

Hurricane Frances - *September 2004*: Category 2 hurricane makes landfall in east-central Florida, causing significant wind, storm surge, and flooding damage in FL, along with considerable flood damage in the states of GA, SC, NC, and NY due to 5-15 inch rains. Total Estimated Costs: \$9.0 (11.1) Billion; 48 Deaths

Hurricane Charley - *August 2004*: Category 4 hurricane makes landfall in southwest Florida, resulting in major wind and some storm surge damage in FL, along with some damage in the states of SC and NC. Total Estimated Costs: \$15.0 (18.5) Billion; 35 Deaths

Severe Storms, Hail, Tornadoes - *May 2004*: Midwest, South, Southeast, North, Northeast hit by severe weather and tornadoes; Total Estimated Costs: \$1.0 (1.2) Billion; 4 Deaths

2003

California Wildfires - *October-November 2003*: Dry weather, high winds, and resulting wildfires in Southern California. More than 743,000 acres of brush and timber burned, over 3,700 homes destroyed. Total Estimated Costs: \$2.5 (3.2) Billion; 22 Deaths

Hurricane Isabel - *September 2003*: Category 2 hurricane makes landfall in eastern North Carolina, causing considerable storm surge damage along the coasts of NC, VA, and MD, with wind damage and some flooding due to 4-12 inch rains in NC, VA, MD, DE, WV, NJ, NY, and PA. Total Estimated Costs: \$5.0 (6.3) Billion; 55 Deaths

Severe Weather - *July 2003*: Severe storms move across the South, Southeast, Midwest, North, Northeast; Total Estimated Costs: \$1.0 (1.2) Billion; 7 Deaths

Severe Storms/Tornadoes - *May 2003*: Numerous tornadoes over the midwest, Mississippi valley, OH/TN valleys, and portions of the southeast, with a modern record one-week total of approximately 400 tornadoes reported; Total Estimated Costs: \$3.4 (4.3) Billion; 51 Deaths

Severe Storms/Hail Early - *April 2003*: Severe storms and large hail over the southern plains and lower MS valley, with Texas hardest hit, and much of the monetary losses due to hail. Total Estimated Costs: \$1.6 (2.0) Billion; 3 Deaths

2002

Western Fire Season - *September 2002*: Major fires over 11 western states from the Rockies to the west coast, due to drought and periodic high winds, with over 7.1 million acres burned. Total Estimated Costs: \$2.0 (2.6) Billion; 21 Deaths

Widespread Drought - *September 2002*: Moderate to extreme drought over large portions of 30 states, including the western states, the Great Plains, and much of the eastern U.S. Total Estimated Costs: \$10.0 (12.9) Billion

Severe Storms and Tornadoes - *May 2002*: Numerous tornadoes over the Central and Eastern states (NC, GA, VA, TX, AR, MO, MS, TN, IL, IN, KY, PA, MD, NY, OH, WV, KS). Total Estimated Costs: \$1.7 (2.2) Billion; 7 Deaths

2001

Tropical Storm Allison - *June 2001*: The persistent remnants of Tropical Storm Allison produce rainfall amounts of 30-40 inches in portions of coastal Texas and Louisiana, causing severe flooding especially in the Houston area, then moves slowly northeastward; fatalities and significant damage reported in TX, LA, MS, FL, VA, and PA Total Estimated Costs: \$5.0 (6.6) Billion; 43 Deaths

Midwest/Ohio Valley Hail and Tornadoes - *April 2001*: Storms, tornadoes, and hail in the states of TX, OK, KS, NE, IA, MO, IL, IN, WI, MI, OH, KY, WV, and PA, over a 6-day period. Total Estimated Costs: \$1.9 (2.5) Billion; 3 Deaths

2000

Drought/Heat Wave - *Spring-Summer 2000*: Severe drought and persistent heat over south-central and southeastern states causing significant losses to agriculture and related industries; Total Estimated Costs: \$4.0 (5.4) Billion; 140 Deaths

Western Fire Season - *Spring-Summer 2000*: Severe fire season in western states due to drought and frequent winds, with nearly 7 million acres burned. Total Estimated Costs: \$2.0 (2.7) Billion

1999

Hurricane Floyd - *September 1999*: Large, category 2 hurricane makes landfall in eastern NC, causing 10-20 inch rains in 2 days, with severe flooding in NC and some flooding in SC, VA, MD, PA, NY, NJ, DE, RI, CT, MA, NH, and VT. Total Estimated Costs: \$6.0 (8.4) Billion; 77 Deaths

Drought/Heat Wave - *Summer 1999*: Very dry summer and high temperatures, mainly in eastern U.S., with extensive agricultural losses. Total Estimated Costs: \$1.0 (1.4) Billion; 502 Deaths

OK-KS Tornadoes - *May 1999*: Outbreak of F4-F5 tornadoes hit the states of Oklahoma and Kansas, along with Texas and Tennessee, Oklahoma City area hardest hit. Total Estimated Costs: \$1.6 (2.2) Billion; 55 Deaths

AR-TN Tornadoes - *January 1999*: Two outbreaks of tornadoes in 6-day period strike Arkansas and Tennessee; Total Estimated Costs: \$1.3 (1.8) Billion; 17 Deaths

Winter Storm - *January 1999*: South, Southeast, Midwest, Northeast affected by damaging winter storm; Total Estimated Costs: \$1.0 (1.4) Billion; 25 Deaths

1998

California Freeze - *December 1998*: A severe freeze damaged fruit and vegetable crops in the Central and Southern San Joaquin Valley. Extended intervals of sub 27° F temperatures occurred over an 8-day period. Total Estimated Costs: \$2.5 (3.6) Billion

Texas Flooding - *October 1998*: Severe flooding in southeast Texas from 2 heavy rain events, with 10-20 inch rainfall totals; Total Estimated Costs: \$1.0 (1.4) Billion; 31 Deaths

Hurricane Georges - *September 1998*: Category 2 hurricane strikes Puerto Rico, Virgin Islands, Florida Keys, and Gulf coasts of Louisiana, Mississippi, Alabama, and Florida panhandle, 15-30 inch 2-day rain totals in parts of Alabama and Florida; Total Estimated Costs: \$5.9 (8.4) Billion; 16 Deaths

Southern Drought/Heat Wave - *Summer 1998*: Severe drought and heat wave from Texas/Oklahoma eastward to the Carolinas; Total Estimated Costs: \$7.5 (10.7) Billion; 200 Deaths

Hurricane Bonnie - *August 1998*: Category 3 hurricane strikes eastern North Carolina and Virginia, extensive agricultural damage due to winds and flooding, with 10-inch rains in 2 days in some locations. Total Estimated Costs: \$1.0 (1.4) Billion; 3 Deaths

Severe Storms, Tornadoes - *late May-early June 1998*: Severe storms in late May through early June hit the Midwest, North, Northeast, and Southeast; Total Estimated Costs: \$1.0 (1.4) Billion; 20 Deaths

Minnesota Severe Storms/Hail - *May 1998*: Very damaging severe thunderstorms with large hail over wide areas of Minnesota; Total Estimated Costs: \$1.5 (2.1) Billion; 1 Deaths

Southeast Severe Weather - *Winter-Spring 1998*: Tornadoes and flooding in southeastern states; Total Estimated Costs: \$1.0 (1.4) Billion; 132 Deaths

Northeast Ice Storm - *January 1998*: Intense ice storm hits Maine, New Hampshire, Vermont, and New York, with extensive forestry losses; Total Estimated Costs: \$1.4 (2.0) Billion; 16 Deaths

1997

Northern Plains Flooding - *Spring 1997*: Severe flooding in Dakotas and Minnesota due to heavy spring snowmelt; Total Estimated Costs: \$3.7 (5.4) Billion; 11 Deaths

MS & OH Valleys Flood/Tornadoes - *March 1997*: Tornadoes and severe flooding hit the states of AR, MO, MS, TN, IL, IN, KY, OH, and WV, with over 10 inches of rain in 24 hours in Louisville. Total Estimated Costs: \$1.0 (1.5) Billion; 67 Deaths

West Coast Flooding - *December 1996-January 1997*: Torrential rains (10-40 inches in 2 weeks) and snowmelt produce severe flooding over portions of CA, WA, OR, ID, NV, and MT. Total Estimated Costs: \$3.0 (4.4) Billion; 36 Deaths

1996

Hurricane Fran - *September 1996*: Category 3 hurricane strikes North Carolina and Virginia, over 10-inch 24-hour rains in some locations and extensive agricultural and other losses. Total Estimated Costs: \$5.0 (7.4) Billion; 37 Deaths

Southern Plains Drought - *Fall 1995-Summer 1996*: Severe drought in agricultural regions of southern plains--Texas and Oklahoma most severely affected; Total Estimated Costs: \$5.0 (7.4) Billion

Pacific Northwest Severe Flooding - *February 1996*: Very heavy, persistent rains (10-30 inches) and melting snow over OR, WA, ID, and western MT. Total Estimated Costs: \$1.0 (1.5) Billion; 9 Deaths

Blizzard/Floods - *January 1996*: Very heavy snowstorm (1-4 feet) over Appalachians, Mid-Atlantic, and Northeast; followed by severe flooding in parts of same area due to rain and snowmelt. Total Estimated Costs: \$3.0 (4.4) Billion; 187 Deaths

1995

Hurricane Opal - *October 1995*: Category 3 hurricane strikes Florida panhandle, Alabama, western Georgia, eastern Tennessee, and the western Carolinas, causing storm surge, wind, and flooding damage. Total Estimated Costs: \$3.0 (4.6) Billion; 27 Deaths

Hurricane Marilyn - *September 1995*: Category 2 hurricane impacts U.S. Virgin Islands and Puerto Rico; Total Estimated Costs: \$2.1 (3.2) Billion; 13 Deaths

South Plains Severe Weather - *May 1995*: Torrential rains, hail, and tornadoes across Texas-Oklahoma and southeast Louisiana-southern Mississippi, with Dallas and New Orleans areas (10-25 inch rains in 5 days) hardest hit. Total Estimated Costs: \$5.5 (8.4) Billion; 32 Deaths

California Flooding - *January-March 1995*: Frequent winter storms cause 20-70 inch rainfall and periodic flooding across much of California; Total Estimated Costs: \$3.0 (4.6) Billion; 27 Deaths

1994

Western Fire Season - *Summer-Fall 1994*: Severe fire season in western states due to dry weather; Total Estimated Costs: \$1.0 (1.6) Billion

Texas Flooding - *October 1994*: Torrential rain (10-25 inches in 5 days) and thunderstorms cause flooding across much of southeast Texas; Total Estimated Costs: \$1.0 (1.6) Billion; 19 Deaths

Tropical Storm Alberto - *July 1994*: Remnants of slow-moving Alberto bring torrential 10-25 inch rains in 3 days, widespread flooding and agricultural damage in parts of Georgia, Alabama, and panhandle of Florida. Total Estimated Costs: \$1.0 (1.6) Billion; 32 Deaths

Tornadoes - *April 1994*: South, Southwest, Southeast, Midwest hit by tornadoes. Total Estimated Costs: \$(1.5)* Billion; 3 Deaths

Southeast Ice Storm - *February 1994*: Intense ice storm with extensive damage in portions of TX, OK, AR, LA, MS, AL, TN, GA, SC, NC, and VA. Total Estimated Costs: \$3.0 (4.7) Billion; 9 Deaths

Winter Damage, Cold Wave - *January 1994*: Winter storm affects Southeast and Northeast; Total Estimated Costs: \$1.0 (1.6) Billion; 70 Deaths

1993

California Wildfires - *Fall 1993*: Dry weather, high winds and wildfires in Southern California; Total Estimated Costs: \$1.0 (1.6) Billion; 4 Deaths

Southeast Drought/Heat Wave - *Summer 1993*: Southeast Drought and heat wave across Southeastern U.S. Total Estimated Costs: \$1.0 (1.6) Billion; 16 Deaths

Midwest Flooding - *Summer 1993*: Severe, widespread flooding in central U.S. due to persistent heavy rains and thunderstorms. Total Estimated Costs: \$21.0 (33.8) Billion; 48 Deaths

Storm/Blizzard - *March 1993*: Storm of the Century hits entire eastern seaboard with tornadoes (FL), high winds, and heavy snows (2-4 feet). Total Estimated Costs: \$5.5 (8.9) Billion; 270 Deaths

1992

Nor'easter - *December 1992*: Slow-moving storm batters northeast U.S. coast, New England hardest hit. Total Estimated Costs: \$1.5 (2.5) Billion; 19 Deaths

Hurricane Iniki - *September 1992*: Category 4 hurricane hits Hawaiian island of Kauai; Total Estimated Costs: \$1.8 (3.0) Billion; 7 Deaths

Hurricane Andrew - *August 1992*: Category 4 hurricane hits Florida and Louisiana, high winds damage or destroy over 125,000 homes; Total Estimated Costs: \$27.0 (44.8) Billion; 61 Deaths

Severe Storms, Hail - *June 1992*: Severe storms with hail hit Kansas and Oklahoma; Total Estimated Costs: \$(1.2)* Billion

Hail, Tornadoes - *April 1992*: Severe Storms hit Oklahoma and Texas with tornadoes and hail; Total Estimated Costs: \$1.0 (1.6) Billion

Severe Storms - *March 1992*: Severe storms affect the South, Southeast; Total Estimated Costs: \$(1.3)* Billion

1991

Oakland Firestorm - *October 1991*: Oakland, California firestorm due to low humidities and high winds; Total Estimated Costs: \$2.5 (4.3) Billion; 25 Deaths

Hurricane Bob - *August 1991*: Hurricane affecting coastal North Carolina, Long Island, and New England. Total Estimated Costs: \$1.5 (2.6) Billion; 18 Deaths

Severe Storms, Tornadoes - *March 1991*: Severe storms hit the Midwest, Southeast, Northeast; Total Estimated Costs: \$(1.1)* Billion

1990

California Freeze - *December 1990*: Severe freeze in the Central and Southern San Joaquin Valley caused the loss of citrus, avocado trees, and other crops in many areas. Several days of subfreezing temperatures occurred, with some valley locations in the teens. Total Estimated Costs: \$3.4 (6.1) Billion

Hail Storm - *July 1990*: Denver, CO (including airport) hit by hail storm; Total Estimated Costs: \$(1.4)* Billion

Southern Flooding - *May 1990*: Torrential rains cause flooding along the Trinity, Red, and Arkansas Rivers in TX, OK, LA, and AR; Total Estimated Costs: \$1.0 (1.8) Billion; 13 Deaths

1989

Winter Damage, Cold Wave, Frost - *December 1989*: Northeast, Southeast hit by winter storms. Total Estimated Costs: \$(1.2)* Billion; 100 Deaths

Hurricane Hugo - *September 1989*: Category 4 hurricane devastates South and North Carolina with ~20 foot storm surge and severe wind damage after hitting Puerto Rico and the U.S. Virgin Islands; Total Estimated Costs: \$9.0 (16.9) Billion; 86 Deaths

Northern Plains Drought - *August 1989*: Severe summer drought over much of the northern plains with significant losses to agriculture; Total Estimated Costs: \$1.0 (1.9) Billion

Severe Storms - *May 1989*: South, Southeast damaged by severe storms; Total Estimated Costs: \$(1.1)* Billion; 21 Deaths

1988

Drought/Heat Wave - *Summer 1988*: 1988 drought in central and eastern U.S. with very severe losses to agriculture and related industries. Excess mortality due to heat stress included in death estimate. Total Estimated Costs: \$40.0 (78.8) Billion; 7,500 Deaths

1986

Southeast Drought Heat Wave - *Summer 1986*: Severe summer drought in parts of the southeastern U.S. with severe losses to agriculture; Total Estimated Costs: \$1.3 (2.8) Billion; 100 Deaths

1985

Hurricane Juan - *October 1985*: Category 1 hurricane--Louisiana and Southeast U.S.-- severe flooding; Total Estimated Costs: \$1.5 (3.2) Billion; 63 Deaths

Hurricane Gloria - *September 1985*: Hurricane Gloria moved along the eastern seaboard affecting states from North Carolina to Maine. Total Estimated Costs: \$1.0 (2.1) Billion; 11 Deaths

Hurricane Elena - *September 1985*: Category 3 hurricane--Florida to Louisiana; Total Estimated Costs: \$1.3 (2.8) Billion; 4 Deaths

Florida Freeze - *January 1985*: Severe freeze central/northern Florida; Total Estimated Costs: \$1.2 (2.6) Billion

Winter Damage, Cold Wave - *January 1985*: Extreme cold and winter storms in the Southeast, South, Southwest, Northeast, Midwest, and North; Total Estimated Costs: \$(1.2)* Billion; 150 Deaths

1984

Tornadoes, Severe Storms, Floods - *Spring 1984*: Southeast, Northeast hit by tornadoes, severe storms, and floods; Total Estimated Costs: \$(1.1)* Billion; 80 Deaths

1983

Florida Freeze - *December 1983*: Severe freeze central/northern Florida; Total Estimated Costs: \$2.0 (4.7) Billion

Hurricane Alicia - *August 1983*: Category 3 hurricane--Texas; Total Estimated Costs: \$3.0 (7.0) Billion; 21 Deaths

Gulf States Storms and Flooding - *early March 1983*: Severe storms and flooding, especially in the states of TX, AR, LA, MS, AL, GA, and FL; Total Estimated Costs: \$1.1 (2.6) Billion; 45 Deaths

Western Storms & Flooding - *late February 1983*: Severe storms and flooding, especially in the states of WA, OR, CA, AZ, NV, ID, UT, and MT; Total Estimated Costs: \$1.1 (2.6) Billion; 50 Deaths

1982

Severe storms - *June 1982*: South, Midwest, Southeast and Northeast affected by severe storms; Total Estimated Costs: \$(1.2)* Billion; 30 Deaths

1981

Severe Storms, Flash Floods, Hail, Tornadoes - *May 1981*: Severe storms in the South, Southeast, and Midwest; Total Estimated Costs: \$(1.0)* Billion; 20 Deaths

1980

Drought/Heat Wave - *June-September 1980*: Central and eastern U.S. drought/heat wave caused damage to agriculture and other related industries. Excess mortality due to heat stress included in death estimate. Total Estimated Costs: \$20.0 (56.4) Billion; 10,000 Deaths

Hurricane Allen - *August 1980*: Hurricane Allen hits Louisiana and Texas; Total Estimated Costs: \$(1.7)* Billion; 13 Deaths

**Exceeds one-billion dollar threshold after 2013 Consumer Price Index adjustment*

Caveat for economic loss estimates:

These statistics were taken from a wide variety of sources and represent, to the best of our ability, the estimated total costs of these events -- that is, the costs in terms of dollars that would not have been incurred had the event not taken place. Insured and uninsured losses are included in damage estimates. These estimates are likely to change as damage assessments become more complete. Estimates are periodically updated as more data/information become available. Sources include the National Weather Service, the Federal Emergency Management Agency, US Department of Agriculture, other U.S. government agencies, individual state emergency management agencies, state and regional climate centers, media reports, and insurance industry estimates including Property Claim Services and Munich Re. This report is also available at <http://www.ncdc.noaa.gov/billions/> and includes links to detailed technical reports on many of these events.

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